

**REMARKS**

Upon entry of the present Reply, claims 1, 4-8 and 10-17 are pending in the present application. Claims 1, 10 and 11 are amended, and claims 2, 3 and 9 are cancelled. New claim 17 is added. Support for the new claim may be found, for example, in the application as filed at page 8, line 6.

Reconsideration of the application and claims is respectfully requested based on the amended claims and the following remarks.

**Rejections Over Prior Art**

Claims 1-12 stand rejected as anticipated by, and claim 16 stands rejected as obvious over, Willard, US 4,689,230. Claim 13 stands rejected as obvious over Willard in view of Lozano, ES 2019044. Claim 14 stands rejected as obvious over Willard in view of Slaybaugh, US 3512990. Claim 15 stands rejected as obvious over Willard in view of Cole, US 3219464. Applicants respectfully traverse the rejections for at least the following reasons.

Applicants respectfully request consideration of the following points in support of the Applicants' position that the presently pending claims patentably distinguish the presently disclosed and claimed invention from the references cited in the Office Action to which the present Reply is responsive:

Regarding claims 1-12 and 16, the object of Willard is to provide a more natural potato flavor in the food products prepared from processed potatoes. However, the present invention relates to a method for the reduction of acrylamide formation. Therefore, the objects of the inventions are completely different.

In addition, Willard is applicable only to potato-based food products. However, the present invention can be widely used for any foods or food ingredients regardless of the composition thereof.

Moreover, the object of Willard can be achieved only by adding the flavor balancing ingredients, i.e., the potato flavor enhancing composition, not by only

adding acid as in the present invention. Specifically, the flavor enhancing composition of Willard comprises a sugar component, an acidic component, a metallic flavor component, and a bitter flavor component (see, e.g., claim 1 of Willard). Thus, the above components should be used altogether at the same time in predetermined composite proportions (see, e.g., claims 1, 3 and 5 of Willard) in the composition of the flavor enhancing components so that the resulting composition provides a composite flavor profile that resembles a fresh potato flavor without the flavor of any one of the previously mentioned flavor components being dominant. That is, the object of Willard could not be achieved by adding just one or two of the previously mentioned flavor balancing ingredients. Furthermore, the claimed acid components of Willard are only confined to citric acid and malic acid, indicating clearly that the object of adding the acidic components are for taste or flavor, not for lowering the pH of the food products.

In contrast, the reduction of the acrylamide formation can be achieved by just adding acid only, thereby protonating a nucleophilic  $\alpha$ -amino group and converting it into a non-nucleophilic protonated amine, as recited in the claims of the present application) in the present invention regardless of the types of acid. Therefore, any other components disclosed in Willard other than acid are not necessary in the reaction of the present invention.

Regarding claim 13, Lozano discloses an inhibition method of the browning reaction in potatoes by treating the potatoes in the aqueous solution of citric acid or citric acid light metal salt, sodium bisulphate, phosphoric acid, and sodium hydroxide at 70 to 95 °C (see claim 1 of cited invention 2).

Thus, as in Willard, additional components other than acid are needed to achieve the object of Lozano. In addition, the temperature should be maintained within a certain range (70 to 95 °C) in the Lozano process. Moreover, a sodium hydroxide, which is a strong alkaline material, is added to potatoes to neutralize

the acidity of the acids in Lozano. Therefore, the pH of potatoes is not lowered by the addition of the acid in Lozano.

In contrast, the present invention provides a method to inhibit the formation of the toxic material by adding acid, thereby lowering the pH of the potatoes, regardless of the treating temperature.

Regarding claim 14, Slaybaugh relates to a method of producing a crisp, fried dough product in the form of a scoop, cup or container, suitable for holding condiments or dips. Thus, the object and composition of Slaybaugh are quite different from those of the present invention.

Although monosodium phosphate is described as a conventional additive used in the preparation of the dough (see column 1, lines 55 to 65 in Slaybaugh), a method of lowering pH or inhibiting the formation of toxic material is never described in Slaybaugh.

Specifically, in Slaybaugh, alkaline materials, such as sodium bicarbonate (pH 8.3), disodium phosphate (pH 8.8-9.0), calcium carbonate (pH 9.8), are used as conventional additives as well as monosodium phosphate. Furthermore, they are just examples of additives, which are not essential in the method of Slaybaugh.

Regarding claim 15, Cole is directed to a method of preparing palatable dehydrated mashed potatoes which, when rehydrated, duplicate the flavor and texture of mashed potatoes produced directly from cooked potatoes (see column 1 of Cole). The Cole method comprises a pre-cooking step conducted at a temperature between 140 and 180 °F (between about 60 and 82 °C) in the presence of a phosphate buffer system (see, e.g., claim 11 of Cole), followed by a main cooking step in a final cooker containing plain hot water or atmospheric steam at 212 °F (about 100°C). After being mashed, the potatoes are dehydrated in a drier (see columns 3 and 4 of Cole). In fact, the mashed potatoes are cooked at a temperature at 100 °C in Cole. However, it has been

well known that acrylamide cannot be formed at a temperature below 120 °C. Therefore, it is obvious that acrylamide would not be not formed in any reaction in the process of Cole.

Thus, the heat treatment in Cole, boiling in the water or steaming at 100°C, is quite different from the treatments of the present invention, such as frying, baking, roasting, high temperature extrusion, and high temperature injection. It is also obvious that the heat treatments of the present invention cannot be applied to the method of Cole.

In addition, the buffer system of Cole is adjusted to pH 6 to 8 (see, e.g., claim 1 of Cole), which is higher than the original pH of the potatoes, pH 6.2 (see attached (IDS) reference, Jung et al., 2003). Thus, the purpose of adding acidic material in Cole is completely different from that of the present invention, in which acid is added to lower the pH to inhibit the acrylamide formation.

#### **New Claim 17**

New claim 17 specifies that the pH-lowering agent consists essentially of citric acid. This claim fully distinguishes over Willard, and the other cited references, which requires the use of additional ingredients. Thus, in addition to the foregoing distinctions over the cited references, claim 17 further distinguishes thereover and is believed allowable.

In conclusion, the object and constitution of the present invention are quite different from those of the cited references, Willard, Lozano, Slaybaugh and Cole. Applicants respectfully submit that the present invention cannot be easily conceived by a person skilled in the art. Therefore, Applicants respectfully submit that the present invention has novelty and inventiveness over the cited references, Willard, Lozano, Slaybaugh and Cole.

For the above reasons it is believed that the subject-matter now on file is in a condition for allowance.

**Conclusion**

Applicant respectfully submits that, for at least the foregoing reasons, the presently claimed invention fully patentably distinguishes over the prior art of record and over the prior art generally. Accordingly, Applicant respectfully requests the Examiner to reconsider and withdraw the rejections of Applicant's claims, and to allow the claims and application to issue in a patent.

In the event issues arise as a result of the filing of this paper, or remain in the prosecution of this application, Applicant requests that the Examiner telephone the undersigned attorney to expedite allowance of the application. No additional fee is believed due for the newly added claim, since a total of only 17 claims are pending in the application. If any additional fees are required for the filing of this paper, the Commissioner is authorized to charge those fees to Deposit Account #18-0988, Docket No. NAMNP0104US.

Respectfully submitted,

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